How goes the revolution?

How goes the revolution? Three themes in the shifting MOOC landscape

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Since the rise to prominence of the MOOC platform organisations in 2012, over 4500 courses have been offered to date (Online Course report, 2016). However, despite the claims of innovation, disruption and revolution that continue to drive MOOC hyperbole, the general understanding of learning in MOOCs remains somewhat conventional, and certainly under-theorised. Assumptions about MOOC learning remain differentiated around the 'xMOOC' and 'cMOOC' terms, supposedly defining a centralised platform model, and a more distributed networked arrangement respectively. In this version of events, the platform MOOC facilitates the broadcast of prestigious educational content to a 'massive' population of viewers, while the more experimental 'connectivist' (cMOOC) courses foreground self-direction and autonomy, and eschew traditional notions of the teacher and the educational institution. These opposing ideas have tended to characterise MOOC learning in terms of audience behaviour (in the xMOOC), or student-driven network creation (in the case of the cMOOC). Put differently, the MOOC story is either about university lecturers teaching greater numbers of students with identical

content, or students self-organising in large, and generally cohesive communities. This paper will outline a number of critical perspectives through which different understandings of MOOC learning (and teaching) can be approached. Drawing on specific examples from current MOOC offerings and organisational developments, this paper will discuss: the trends for particular subject disciplines in MOOCs to date, alongside a continued promotional stance that claims broad sector disruption; a shift from 'massive' class enrolments towards 'small' and 'private' groupings, alongside more automated course delivery; and the developing relationship between MOOCs and learning analytics, indicative of an imminent and potent mainstreaming of predictive and interventionist data science in education (Williamson, 2015). Moving across these three themes, this paper will discuss the emerging figure of the 'MOOC learner', the function and responsibilities of teaching and the teacher, as well as the influence of technology on these roles and practices.

Keywords: MOOC Learning; Learning Analytics; Data Science.

I. Introduction

In the four years since the promotional machinery of Udacity, Coursera and edX propelled open (and online) education into the spotlight, the MOOC landscape has shifted. However, despite the prudent scepticism that accompanied much of the inflated revolutionary narrative of the MOOC, research in 2016 showed that over 4500 courses had been offered (ONLINE COURSE REPORT, 2016), and around 58 million students had registered (SHAH, 2016). By this narrow measure, we might say that the MOOC format has endured the precarious swells of the hype cycle. But how might it settle? What happens when the innovation begins to inhabit the institution?

Assumptions about the development of MOOCs often remain differentiated around the 'xMOOC' and 'cMOOC' terms, supposedly defining a centralised platform model, and a more distributed networked arrangement respectively. In this version of events, the platform MOOC facilitates the broadcast of prestigious educational content to a 'massive' population of viewers, while the more experimental 'connectivist' (cMOOC) foregrounds self-direction and autonomy, and eschews traditional notions of the teacher and the educational institution. These opposing ideas have tended to characterise MOOC learning in terms of audience behaviour (in the xMOOC), or student-driven network creation (in the case of the cMOOC). Put differently, the MOOC story is either about university lecturers teaching greater numbers of students with identical content, or students self-organising in large, and generally cohesive communities. Importantly, both accounts retain the idea of a disruptive, radical, and external intervention, profoundly and progressively influencing the archaic institution from the outside.

Much has already been written about the differences in the design, pedagogy and technology involved in these MOOCs (RODRIGUEZ, 2013), and advocates of the 'cMOOC' variety have, in particular, often appeared to distance themselves from the more mainstream category, most closely associated with Stanford University. Indeed, the very distinction was proposed by 'cMOOC' pioneer Stephen Downes (DOWNES, 2012). The mainstream attention garnered by the promotional machines of the platform-based MOOCs has incited something of a defence from those who have worked extensively with educational technology, distance learning, and open education (BATES, 2014). For Weller, this 'battle for open' (2014) has been characterised as something of a David and Goliath encounter, albeit where the venture capitalists triumph. However, this kind of debate has tended to characterise any critical discourse as the claiming of a genuine and original MOOC practice. This has too often merely served to intensify an uncritical assumption of the natural worth of the open education movement,

which can rest in the assumed moral high ground of authenticity and extra-institutional radicality.

Within this adversarial arrangement, important opportunities for critical insights about the MOOC are overlooked, principally due to an over-enthusiasm for the revolutionary and emancipatory benefits of technology; either the 'networked' and 'social' technologies of the cMOOCs, or the broadcast media of the xMOOCs. Regardless of which MOOC category one might choose to advocate, the oppositional framing of the debate has shaped and delimited the kinds of critical questions and perspectives that can be raised. While the 'cMOOC' and 'xMOOC' categorisations have indicated important differences in approaches to pedagogy, the interpretation of open education, and ways of designing courses, there are other sets of influences that have more powerful effects on the development of MOOCs, and the shifting of the higher education sector as a result. A focus on such categorisations, and their supposed benefits and shortcomings, tends to centre the MOOC debate around rather inward-looking and traditional educational concerns: retention, student achievement, assessment methods, and course design. While valuable, this overwhelming focus needs to be accompanied by wider perspectives which examine the project of the MOOC itself, as a broad set of influences which are shaping our understandings of the culture, economics, and politics of higher education. Alongside being interested in, and researching, questions such as '(how) do students learn in MOOCs?', we also need to develop a scholarship of the MOOC itself, to examine how this high-profile course format is impacting our ideas of what education is, and in turn, how it is involved in both reflecting and shaping 'us', as human beings embroiled in increasingly global educational practices. Both the 'cMOOC' and 'xMOOC' models tend to naturalise a particular kind of learner: with either instinctive capacities for social and cooperative interaction in the case of the former; or innate abilities for passively absorbing information in the case of the latter. More work is needed to trace

the ways that these assumptions work to produce and establish powerful models of 'the learner' in higher education today.

Drawing on specific examples from current course offerings and organisational developments, this chapter will discuss three key areas that help to define the current state of the MOOC, and point towards future directions for the format as it moves beyond the initial stages of innovation: the predominance of particular subject disciplines, alongside a continued promotional stance that claims broad sector disruption; a shift from 'massive' class enrolments towards 'small' and 'private' groupings; and the developing relationship between MOOCs, automation, and learning analytics. Moving across these three themes, this chapter will examine the ways particular ideas about learning combine with particular assumptions about technology to produce the contemporary subject of education.

II. Disciplines and specialisations

The cMOOC format has largely been utilised to convey and demonstrate the proposed learning theory of connectivism, rather than being used to teach a range of different subject disciplines. Moreover, one might conclude that these courses were not really concerned with attempting to impart knowledge in any traditional sense, but were rather intended to teach a *process* of learning (DOWNES, 2015), specifically one focusing on self-direction and the unfurling of innate individual potentials (TSCHOFEN; MACKNESS, 2012).

In this sense, diversity of topic might be said to have never been part of the MOOC project, which has always been somewhat specialised. Nevertheless, the rise of Udacity, Coursera and edX can be understood as shifting the idea of the MOOC from a set of specific and invested ideas around the processes of learning, to the notion of a neutral *platform*, able to elevate and broadcast the

teaching of any given subject. While the founders of Udacity and Coursera had backgrounds in computer science disciplines, for the teaching of which their platforms appeared to be particularly suited, early examples demonstrated a fairly broad scope of topics, including history, science fiction, and poetry[1]. This provision of humanities topics in particular received considerable media attention (KONSTANTINOU, 2013),and appeared to establish the idea that the MOOC, as a 'platform', was able to support the teaching of any discipline. Indeed, this claim of universal value has been an important aspect of MOOC promotion, feeding into the idea that the format was capable of replacing the institution (MARGINSON, 2012).

While the total number of people who have signed up to at least one MOOC has been estimated at 58 million[2] (SHAH, 2016), a 2016 review of MOOC offerings indicated that those courses categorised as deriving from the Humanities were in rapid decline, 'from 20 percent of overall subject distribution in 2013 to less than 10 percent in 2015' (ONLINE COURSE REPORT, 2016). This demonstrates the significant attention given to MOOCs from particular subject disciplines, a tendency which is indicative of important contemporary conditions in the MOOC project. As is also highlighted in this chapter, the large US-based MOOC organisations are clearly moving towards initiatives designed to monetise their offerings, and it is important to recognise these directions as intrinsically linked. Topics which are perceived to be related to tangible opportunities for gainful employment may seem more attractive, and cost-effective, to potential MOOC participants.

1 Notable early Coursera MOOCs include: *Fantasy and Science Fiction* from the University of Michigan (see http://www.mooc-list.com/course/fantasy-and-science-fiction-human-mind-our-modern-world-coursera); and *Modern and Contemporary American Poetry* from the University of Pennsylvania (https://www.coursera.org/learn/modpo). Accessed on: 02 February 2017.

2 23 million of which were enrolling for the first time.

MOOCs covering the subjects of data analytics and business are proliferating on the large platforms, including, significantly, courses which combine these topics. Five out of the top ten most popular courses on Coursera in 2016 were related to programming or data analysis[3] (COURSERA, 2017a), a trend mirrored on the edX platform (HAMEDI, 2016). Perhaps most significantly, however, seven out of the ten most popular 'Specialisations' were in the area of programming, data analysis or business (COURSERA, 2017a). 'Specialisations' are combinations of Coursera MOOCs related to specific themes that involve fees, and are offered principally in the areas of business, data science, and programming[4]. Coursera's arrangement and promotion of courses also reveals a strategic organisational bias towards these discipline areas, heading their main course browsing page with 'Hundreds of Specializations and courses in business, computer science, data science, and more' (COURSERA, 2017b).

In these examples, MOOC learners are clearly being steered towards specific topics and choices, often with the implied promise of the relevance and currency of the area. This may signal the significant role of MOOCs in the development of the technology industry, not only tightly aligning its course offerings to the perceived priorities and demands of businesses in this sector, but also providing a considerable portion of the workforce, and defining career outcomes in the process. Such student trajectories are evident in the 'success stories' promoted MOOC organisations. A quick glance at Coursera's blog[5], or edX's 'Learner Stories'[6], reveals a number of posts detailing the successes of corporate training,

3 It may be significant, however, that the most popular course was entitled 'Learning How to Learn' (COURSERA, 2017a).

4 Cf. Coursera, 2016a.

5 Available at: <https://blog.coursera.org>. Accessed on: November 20, 2015.

6 Available at: <http://blog.edx.org/learner-stories/>. Accessed on: November 20, 2015.

start-up companies or computer programming careers, all instigated by the open education on offer.

This shift is, of course, nothing new. Following the public climb-down of Sebastian Thrun in 2013 (DE AMICIS, 2014), and the accompanying strategic shift of Udacity towards a vocational direction, the organisation explicitly aimed at serving the educational demands of the technology industry. This included partnerships with AT&T and the expanding 'nanodegree' (RAO, 2016). Within this MOOC strategy, positive career outcomes may be perceived as a better measure of success than the ability to deliver university credit, which has been lacking in any large scale or organised fashion to date. Nevertheless, the recognition that Coursera and edX – much larger organisations that have gone further in formal partnerships with elite educational institutions – are succumbing to similar trends, is significant. It may be that MOOCs are, in these ways, benefiting from the largely unchallenged rhetoric surrounding 'future skills' and the necessity of digital literacies, such as 'coding', or indeed computational thinking. It seems especially problematic that the platform-based MOOCs may retreat further into the inward-looking Silicon Valley world from which they originated (WATTERS, 2015), serving the educational requirements of an increasingly questionable technology industry (WADHWA, 2014; SCHEIBER, 2014; GUMBEL, 2014).

This trend appears to expose the rigidity and obstinacy of the solutionist model offered by the MOOC platform organisations. Unable to really embrace education, and allow the many different ways it might be practised to shape its offerings, MOOC organisations appear to be retreating into their own self-absorbed world of technology solutionism and business acumen.

III. From 'massiveness' and 'open' to 'small' and 'private'

Perhaps the most prominent aspect of the MOOC has been the idea signified by the first letter of the acronym: 'massive' numbers of participants. For example, during the well-publicised *Introduction to Artificial Intelligence* MOOC, enrolment numbers of over 160,000 were reported (THE GOOD MOOC, 2013). This 'massiveness' has unmistakably been associated with 'open access', bolstering the idea that the capacity for large numbers of participants reflects the networked lives of learners, and directly responds to the increasing global desire for higher education. However, despite arguments for the value of 'massive' class sizes, and the potential richness that such diversity might bring to the learning experience (KNOX, 2014), various initiatives appear resolved to reduce participant numbers and close the open arrangements of the MOOC.

The cMOOC format has been more concerned with 'massiveness' as a product of community formation, and a source of diverse perspectives from which the individual learner might develop digital literacy skills (DOWNES, 2015). In this regard, the interest in large enrolment numbers in the cMOOC has had more to do with providing optimal conditions for a particular cohort than providing access to existing educational disciplines for those adversely affected by geographical and economic barriers. Indeed, Downes's definition of the cMOOC (2015) appears to suggest that the format is only suitable for particular forms of participation and behaviour. This invites a reading of the connectivist format as 'small' and 'private', not in the sense of restricted access to the technology or resources of the MOOC, but rather in the ways that the requirement for a particular academic ability limits the range and diversity of participation. Of course, as Downes, and other cMOOC advocates, would no doubt argue, the purpose of this

format is to demonstrate such literacies so that others can learn how to similarly self-direct through networks of online information.

However, the cMOOC model goes further in its rejection of 'massive' enrolment numbers, at least in the conventional sense of how this aspect is understood. It is the idea of 'community' that underpins the cMOOC; small, cohesive group formations that interact and cooperate, rather than large 'classes' of participants. Indeed, Caulfield (2016) calls for 'protection' from large numbers in education, claiming that authentic and productive communication (and presumably 'learning' itself) can only arise from manageable group sizes. This limitation is captured well in the emergence of 'COOCs', or *Community* Open Online Courses (SHUKIE, 2013); a direct replacement of the 'massive', exemplifying the resistance to scaled education amongst advocates for the cMOOC model.

For the platform-based MOOCs, massive enrolments and open access resources have been the underlying premise for more grand and overt claims of sector disruption and educational progress. This brand of the MOOC, cast as a neutral platform for the global broadcasting of disciplinary knowledge, established the idea that populations without access to higher education might benefit from this 'revolutionary' educational format. While this promise was largely conditional on disadvantaged learners having access to broadband infrastructure capable of streaming video, the MOOC platform model garnered unprecedented media and governmental interest, and became established as a project of widening participation and dissolving barriers to education.

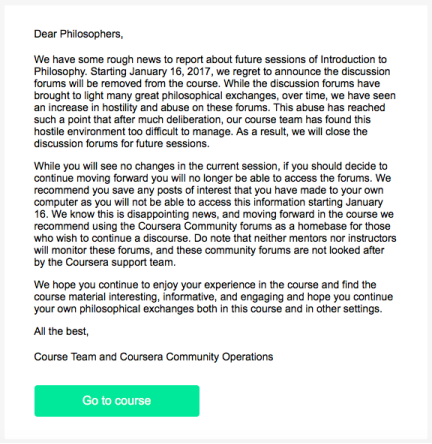
However, the present 'xMOOC' landscape appears significantly less massive and markedly less open. In this way, the platform-based organisations are perhaps following the rejection of 'massive' class sizes, albeit on rather different terms. In 2013, Harvard claimed an interest in what was termed a Small Private Online Course (SPOC) (COUGHLAN, 2013). Swapping large enrolment numbers and free, public access for controlled enrolment, these

courses put forward the idea of using the MOOC format to envisage a more productive institutional educational format. Importantly, this supposed initiative was premised on the claim that large numbers of participants in an open course created an environment that negatively affected the progress of participants. Capping class sizes would ensure that participants were presented with a more traditional setting for their learning. Of course, this scenario would also solve the retention issues that have dogged the discussion of MOOCs (PARR, 2013; KOLOWICH, 2013; RIVARD, 2013), and work towards a model through which institutions would be more likely to offer credit. However, the 'small' and 'private' model does away with the very characteristics that made the MOOC stand out as a potentially disruptive form of innovation. Without public access, and enforcing a selection process (COUGHLAN, 2013), initiatives such as the 'SPOC' would seem to reassert much of the inaccessibility and elitism that the MOOC project sought to overcome in the first place.

While it may be more accurate to suggest that a SPOC is simply an 'online course' offered by an institution – a form of provision established in many institutions well before the MOOC hyperbole – the influence of the latter should not be discounted. The fact that mainstream online provision is now on the agenda for many educational institutions – and perhaps also those that haven't engaged in online provision previously (COUGHLAN, 2016) – attests to the ways that MOOC platforms were able to demonstrate the appeal of online learning. Nevertheless, this 'small' and 'private' is far from the promised forms of disruption, and the tangible barriers to such higher educational offerings appear to as insurmountable as ever. Given Coursera's well-publicised attempts to shift towards fee-only courses (COURSERA, 2016b), one might conclude that the platform model of the MOOC has moved away from the ideals of the open education movement entirely. In this sense, the extent of MOOC influence over higher education may be more in line with the increasing digitisation of established sector practices than their

restructuring according to the principles of openness and equality. Online provision requires a significant investment in hardware and software, and/or a substantial commitment to collaboration with for-profit organisations, binding education ever more closely to the technology industry.

In another notable turn of events, a recent instance of *Introduction to Philosophy*[7] from the University of Edinburgh on the Coursera platform contacted enrolees to announce the closure of course discussion fora (Figure 1).



Dear Philosophers,

We have some rough news to report about future sessions of Introduction to Philosophy. Starting January 16, 2017, we regret to announce the discussion forums will be removed from the course. While the discussion forums have brought to light many great philosophical exchanges, over time, we have seen an increase in hostility and abuse on these forums. This abuse has reached such a point that after much deliberation, our course team has found this hostile environment too difficult to manage. As a result, we will close the discussion forums for future sessions.

While you will see no changes in the current session, if you should decide to continue moving forward you will no longer be able to access the forums. We recommend you save any posts of interest that you have made to your own computer as you will not be able to access this information starting January 16. We know this is disappointing news, and moving forward in the course we recommend using the Coursera Community forums as a homebase for those who wish to continue a discourse. Do note that neither mentors nor instructors will monitor these forums, and these community forums are not looked after by the Coursera support team.

We hope you continue to enjoy your experience in the course and find the course material interesting, informative, and engaging and hope you continue your own philosophical exchanges both in this course and in other settings.

All the best,

Course Team and Coursera Community Operations

Go to course

Figure 1: Email from the Introduction to Philosophy MOOC team, announcing the closure of discussion for all future instances of the course.

The course team describe 'an increase in hostility and abuse' from course participants as the reason for deeming the fora unmanageable (Figure 1). It seems that in this example the discussion space of the course was deemed unconducive to the requirements for learning philosophy. Massive numbers and open

7 Available at: <https://www.coursera.org/learn/philosophy>. Accessed on: December 20, 2016.

access, by this rationale, appear to propagate unruliness, and create a structure which adversely influences authentic engagement with the course material. Significantly, it is the social and discursive elements of the MOOC that are singled out for exclusion, leaving no means for students to communicate with each other within the course itself. The materials and assessments, however, are retained, resulting in a course that appears to be purely didactic. While it remains to be seen if this example is isolated, this kind of move has considerable implications for the kind of education that the MOOC might promote. Given the predominance of social constructivism as the accepted explanatory framework for a theory of learning, courses which excise the social dimension entirely paint a somewhat controversial, and certainly outmoded, picture of the future of MOOC, and university, provision.

Recent developments at Coursera have seen the launch of a course facility designed specifically for businesses and organisations (HILL, 2016). 'Coursera for Business'[8] allows particular groups of colleagues to take a MOOC as a cohort, and that specific instance of the course will be limited to their participation. While clearly a development in Coursera's business model, diversifying the kinds of service they provide and monetising their product in the process, this offering constitutes another form of opposition to the 'massiveness' and 'openness' of the MOOC. Corporate training is aimed directly at groups who are presumably, on account of their employed status, not the least advantaged when it comes to accessing higher education. Moreover, the undertaking of particular courses would seem to be primarily in the interests of the employer rather than the individual 'learner', where an organisation seeks to train staff for the purposes of streamlining or enhancing their business. Individuals may benefit from such an experience; however, this seems rather distanced from the ideals of individual

8 Available at: <https://www.coursera.org/enterprise>. Accessed on: January 20, 2017.

empowerment and educational emancipation suggested in MOOC promotion. As Hill (2016) insightfully shows, Coursera appear to be re-writing the original MOOC rationale to include the vision of corporate learning.

IV. Automation, data, and analytics

While one might argue that pre-recorded video lectures – the primary form of content in the platform-based MOOC – was itself a form of 'teacher automation', further developments in this area may have significant impact in the future. Automated assistants may be one such intervention, drawing on artificial intelligence technology to provide software that can answer student queries (LETZTER, 2016). Importantly, the rationale for this kind of automated process is focused squarely on student retention. Artificially intelligent agents could, it is claimed 'raise the retention rate from say 7% to 15%' (ASHOK GOEL quoted in LETZTER, 2016). The limitations of such automated systems are acknowledged here; however, this shortcoming appears to be used to justify the instrumental application of AI; employed to 'solve' the 'problem' of students dropping out of MOOCs, rather than necessarily improving their educational experience, given that the latter is not necessarily related to the former.

Such automation may be interestingly contrasted with developments around the cMOOC format, namely 'Automated Competency Development and Recognition (ACDR)', part of the 'Learning and Performance Support Systems (LPSS)' project (DOWNES, 2015). ACDR is described as:

> […] a set of intelligent algorithms designed to import or create competency definitions matching employment positions, to support the development of learning plans based on these competencies, to provide resource and service recommendations, and to tackle the seriously

> challenging task of assessing performance based on system and network interactions. (DOWNES, 2015)

While clearly more complex than a chat agent, the need for automated processes appears to underpin the rationale for this kind of system, designed to align learner skills with employment characteristics. The production of competencies or learning plans and the recommendation of resources is viewed as a task too complex or time-consuming for any of the humans that might be involved in this particular educational activity. Whatever the future might be for MOOC learners in both the 'c-' and 'x-' varieties, it seems that they will be accompanied by automated agents.

Automated processing also underpinned many of the research projects that accompanied the rise of the platform-based MOOCs, this time in the form of data analytics. Also utilising powerful algorithms, such studies sought to categorise MOOC learners and their behaviours (PERNA et al., 2013; KIZILCEC et al., 2013). This 'Learning Analytics', bolstered by the massive data sets provided by MOOCs, is similarly premised on the notion that non-human interventions are required to generate important insights and developments, and, once again, are required to fundamentally disrupt education (Siemens, 2013). Elsewhere I have presented a critique of Learning Analytics, focusing on the 'black boxing' of the algorithms involved, the assumption of objectivity, and the desire for prediction in this emerging discipline (see Knox, forthcoming 2017b). In the context of MOOCs, algorithms are used to search for patterns in the huge data sets generated by MOOC participants within the platform software. Interestingly, it is one of the cMOOC pioneers who played a foundational role in establishing the Learning Analytics field that is now used to computationally analyse many of the xMOOCs. George Siemens is founding president of the principal organisation in this area, the Society for Learning Analytics Research (SoLAR), which also includes Stanford University as a

founding member[9], the very institution implicated in the establishing of Coursera and Udacity. Such a small world begins to look increasingly less like a 'battle' for open education, particularly where automation is concerned.

The study of MOOCs could look to work outside of traditional educational research in order to develop more critical approaches to the use of data. Work in the cultural studies of data (ANDREJEVIC et al., 2015) and an emerging critical algorithm studies in education (WILLIAMSON, 2015; PERROTTA; WILLIAMSON, 2016) offer important insights about the ways data and its computational processing do not exist in isolation from broader political and economic influences. Moreover, such work attests to the powerful influence of computational processing not only on the ways that students learn, but also on their formation as learning subjects. Elsewhere I have described in detail the ways that algorithms are influencing MOOC development (KNOX, forthcoming 2017a). This includes: recognition of the ways data is prepared, or 'cleaned' in order to make it usable by computational methods; approaches that algorithmically group and categorise students; and the ways such processes feed into and influence technology development and pedagogical practices. These perspectives highlight the complex conditions through which educational data are *produced*, and have profound influence on the ways we might understand the educational process, serving to challenge narrow instrumentalist views of data methods. Far from straightforwardly representing student behaviour, or transparently reporting objective insights about the learning process, computational methods play a role in constructing new regimes of educational power and dominance, and shape the ways teachers and learners can perform their roles.

A further area of data capture related to MOOCs that needs further attention is the geographical imbalance in the production of

9 Available at: <http://solaresearch.org/about>. Accessed on: November 20, 2016.

research in this area. Veletsianos & Shepherdson (2016) have shown that over 80% of MOOC research produced in between 2013 and 2015 has derived from institutions in the US or Europe. This overwhelming occidental bias appears especially surprising, given the significant, government-backed MOOC projects in developing countries such as India and China[10], and the significant Spanish-language Miríada X[11] platform in Latin America. In particular, the Indian and Chinese initiatives appear to be attempting the kind of large scale accreditation models that US and European MOOC projects have seemed reluctant to undertake. These directions may better reflect the social and humanitarian interests that appeared to dominate early MOOC promotion, yet currently appear outdated and obsolete in the strategies of the US-based platform organisations, as discussed previously. In order to avoid the 'data colonialism' of MOOC practice and research (KNOX 2016), marginalised voices need to be heard, not just to replicate the kind of studies we have seen so far – profiling MOOC enrolees, classifying forms of participation, or measuring retention – simply transposed onto another geographical or cultural contexts, but also to surface new and different kinds of questions that researchers might ask of educational big data.

V. Conclusions

While the research and discussion of MOOCs is largely centred on instrumental questions related to their ability to replicate established institutional provision or 'improve' student performance, more work is needed to develop critical scholarship around the ways this high-profile format is shaping the higher education landscape, and the subjects involved within it. MOOCs

10 See XuetangX (http://www.xuetangx.com), for example. Accessed on: October 23, 2016.

11 Available at: https://miriadax.net/home. Accessed on: October 23, 2016.

have attracted power and attention through the claims of sector disruption and widening participation, yet the extent to which these gaols are being realised remains in question.

In this chapter I have outlined three key areas in which the promise of the MOOC is shifting from its early claims of revolution and disruption: an increasing focus on data science, business, and programming subject disciplines, fundamentally linked to the monetisation strategies of the platform-based MOOCs; deliberate strategies to reduce class sizes in the name of productive learning, and a rejection of the 'massive' enrolments that characterised early MOOCs; and finally, the prevalence of automation and analytics, two areas that signal the increasing use of algorithms to accompany human participation in these courses.

These themes highlight important directions in which the MOOC project is shifting: the drive to monetise MOOCs is foregrounding vocational offerings and corporate training, contributing to the increasingly economic and transactional framing of higher education; an 'institutionalisation' of the disruptive potentials of the MOOC to reflect more established educational provision; and the intensifying use of technology to seek evermore efficiencies in educational practice. Crucially, these directions tie the MOOC to critical issues facing the neoliberal university, and demonstrate its increasing complicity with powerful political and economic forces that influence the education sector.

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